

REMARKS/ARGUMENTS

Claims 1, 2, 5-7, 9 and 11-18 remain in the application, all of which stand rejected. Claims 3, 4, 8 and 10 have been canceled.

1. Objection to Title

The Examiner objects to the title of the invention as being non-descriptive. However, it is applicants' belief that the title corresponds to the scope of their currently pending claims, and is therefore descriptive of that which is claimed. If the Examiner would prefer a different title, applicants request that the Examiner make a suggestion.

2. Information Disclosure Statement

The Examiner indicates that the Information Disclosure Statement (IDS) filed on 7/2/2004 fails to comply with 37 CFR 1.98(a)(2) and, as a result, the IDS filed on 7/2/2004 has not been considered. However, this contradicts the action of the Examiner who was previously assigned to this case, who initialed applicants' Form PTO-1449 on 10/7/2004 to indicate that the references submitted as part of the 7/2/2004 IDS had been considered.

If the newly-assigned Examiner is refuting the actions of the previously-assigned Examiner, applicants ask for a detailed explanation as to why the Examiner is taking this position.

3. Rejection of Claims 1, 2, 5-7, 9 and 11-18 under 35 USC 112, 1st paragraph

Claims 1, 2, 5-7, 9 and 11-18 stand rejected under 35 USC 112, 1st paragraph, as failing to comply with the written description requirement. Specifically, the Examiner asserts:

...The specification recites a first hollow extending from the first side of the substrate to a die and a second hollow (recess) extending from the die to the second side of the substrate. There is no support in the specification for a hollow extending from the first side of the substrate to the second side of the substrate, as recited in claim 1.

8/16/2005 Final Office Action, p. 3, lines 1-5.

Applicants respectfully disagree. Applicants' specification states:

The hollow within the substrate is made up of a first recess 42, in the first major side 44 and a second recess 48 in the second major side 46 (the underside in the orientation of Figure 2), meeting within the substrate.

Specification, p. 7, lines 12-14.

In light of this description, applicants believe the following language of their claim 1 finds support in their specification:

a substrate. . . , wherein the substrate has a first side facing away from the mounting surface and a second side being on the same side of the structure as the mounting surface, and wherein the substrate is hollow, with the hollow extending from the first side of the substrate to the second side of the substrate;

Applicants therefore ask the Examiner to withdraw the rejection of claims 1, 2, 5-7, 9 and 11-18 under 35 USC 112, 1st paragraph.

4. Rejection of Claims 1, 2, 9, 11 and 12 under 35 USC 102(b)

Claims 1, 2, 9, 11 and 12 stand rejected under 35 USC 102(b) as being anticipated by Nicewarner, Jr. (US Pat. No. 5,327,325; hereinafter "Nicewarner").

With respect to applicants' claim 1, the Examiner asserts that Nicewarner teaches:

. . . a packaging structure for a semiconductor device, comprising:
a substrate surface-mountable on a mounting surface of a circuit board, wherein the substrate 12 has a first side facing away from the mounting surface and a second side being on the same side of the structure as the mounting surface, and wherein the substrate is hollow 22, with the hollow 22 extending from the first side of the substrate 12 to the second side of the substrate;
a recess (the recess within and below resin 80) in the second side of the substrate;
a semiconductor die 26, 28 having a first side and a second side, and mounted in said recess, with the first side of the semiconductor die facing away from the mounting surface and a portion of the first side of the semiconductor die bonded to said substrate within the recess by electrically conductive bonding pads 71.

8/16/2005 Final Office Action, pp. 3-4.

Applicants respectfully disagree. To begin, Nicewarner's "substrate support member 12. . .has an upper substantially flat surface 14 and a lower substantially flat surface 16." See, Nicewarner, col. 4, lines 9-11. The "recess 22 is located around the entrance to the cavity 18 in the upper flat surface 14 of the base substrate support member 12 and another substantially identical substantially rectangular shaped recess 24 is located around the entrance to the cavity 20 in the lower flat surface 16 of the base substrate support member 12." See, Nicewarner, col. 4, lines 19-24. However, "[t]he two cavities 18 and 20 are separated by a partition 21 that is part of the substrate support member 12." See, Nicewarner, col. 4, lines 16-18. Thus, the Examiner's assertion that Nicewarner discloses a "hollow 22 extending from the first side of the substrate 12 to the second side of the substrate" is wholly unsupported by Nicewarner's teachings. Furthermore, it does not appear that Nicewarner's partition 21 could be easily removed, as "flip-chip solder bond

connections 71 and 73" bond the "chips 28 and 30" to the "partition 21". See, e.g., Nicewarner, col. 5, lines 1-13.

Applicants' claim 1 is believed to be allowable over Nicewarner's teachings for at least the above reasons.

Applicants' claims 2, 9, 11 and 12 are believed to be allowable at least for the reason that they depend from claim 1.

5. Rejection of Claims 5-7 and 16-18 under 35 USC 103(a)

Claims 5-7 and 16-18 stand rejected under 35 USC 103(a) as being unpatentable over Nicewarner, Jr. (US Pat. No. 5,327,325; hereinafter "Nicewarner") in view of Peterson et al. (US Pat. No. 6,674,159 B1; hereinafter "Peterson").

Applicants' claims 5-7 and 16-18 are believed to be allowable at least for the reason that they depend from applicants' claim 1, and because Peterson fails to disclose that which applicants have already shown is missing from Nicewarner. See, Section 1 of these Remarks/Arguments, *supra*.

Furthermore, applicants can find no suggestion or motivation to combine Nicewarner's and Peterson's teachings, as the incorporation of Peterson's hollow into Nicewarner's package would appear to defeat the purpose of Nicewarner's invention, which is to provide a package that can carry *multiple* chips.

6. Rejection of Claims 13-15 under 35 USC 103(a)

Claims 13-15 stand rejected under 35 USC 103(a) as being unpatentable over Nicewarner, Jr. (US Pat. No. 5,327,325; hereinafter "Nicewarner") in view of Bhagwagar (US Pat. No. 6,791,839 B2).

With respect to applicants' claim 13, the Examiner asserts that Nicewarner discloses the presence of an encapsulant (believed to be encapsulant 80 in FIG. 3)

that is "flush" with the level of the second side of the substrate". Applicants respectfully disagree.

Nicewarner's resin material 80 encapsulates "flip-chip solder bond connections 71 and 73", which are not flush with the substrate that holds chips 28 and 30. Applicants' claim 13 is believed to be allowable for at least this reason, and because Peterson fails to disclose that which applicants have already shown is missing from Nicewarner. See, Section 1 of these Remarks/Arguments, *supra*.

Applicants' claims 14 and 15 are believed to be allowable at least for the reason that they depend from claim 13.

7. Conclusion

In light of the remarks and arguments provided herein, applicants respectfully request the timely issuance of a Notice of Allowance.

Respectfully submitted,
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